

Redescription of *Pseudoprotella inermis* Chevreux, 1927, a rare species of caprellidean amphipod (Crustacea) from Ceuta, North Africa

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Abstract.—*Pseudoprotella inermis* Chevreux, 1927 is redescribed based on specimens collected from Ceuta, on the North African side of the Strait of Gibraltar. This species is previously known only from a single specimen collected from the Gulf of Cadiz, in southern Spain. *Pseudoprotella inermis* differs primarily from *P. phasma* (Montagu 1804), the only other species of the genus, by the absence of body projections.

The Strait of Gibraltar has attracted the attention of marine taxonomists because the Strait is situated on the border of the Mediterranean Sea and the Atlantic Ocean (Fig. 1). In 1998 and 1999 the Laboratorio de Biología Marina de la Universidad de Sevilla conducted a research project on benthic animal communities living among algae and hydroids of Ceuta, North Africa, on a coastline facing the Strait, as part of a scientific program to elucidate the marine fauna and flora of the Strait of Gibraltar. Since two new species of caprellidean amphipods have been recently found from Algeciras Bay, on the northern coast of the Strait of Gibraltar (Sánchez-Moyano et al. 1995a, 1995b), we have focused our research on the species diversity of the Caprellidea inhabiting these waters. During this study, several specimens identified as the genus *Pseudoprotella* (Mayer 1903, Krapp-Schickel 1993, Takeuchi 1993) were found. Because these specimens lacked dorsal body spines, they were identified as *Pseudoprotella inermis* Chevreux, 1927 which was previously known only from a single male specimen collected from the

Gulf of Cadiz, southern Spain (Chevreux 1927). In this paper, we redescribe this rare species of caprellidean amphipod, *Pseudoprotella inermis*, based on specimens collected from Ceuta, North Africa.

Specimens (male “a” and female “b”) are deposited in the Museo Nacional de Ciencias Naturales de Madrid (Spain) (n° MNCN 20.04/4646). Additional material are in the Laboratorio de Biología Marina, Universidad de Sevilla (Spain).

Pseudoprotella inermis Chevreux, 1927
Figs. 2–5

Pseudoprotella inermis.—Chevreux, 1927: 135, pl. 14, figs. 3–5.—McCain & Steinberg, 1970:72.

Material examined.—Male “a,” 10.2 mm in length, from the seaweed *Dilophus spiralis* Hamel at Ceuta (35°54'5"N, 5°16'35"W), between 30 and 40 meters deep, August 1999, coll. Juan Rodríguez. Female “b,” 7.2 mm in length, collected together with male “a.” Other specimens: 5 adult males and 4 juveniles with male “a”; 1 adult male and 2 adult females taken

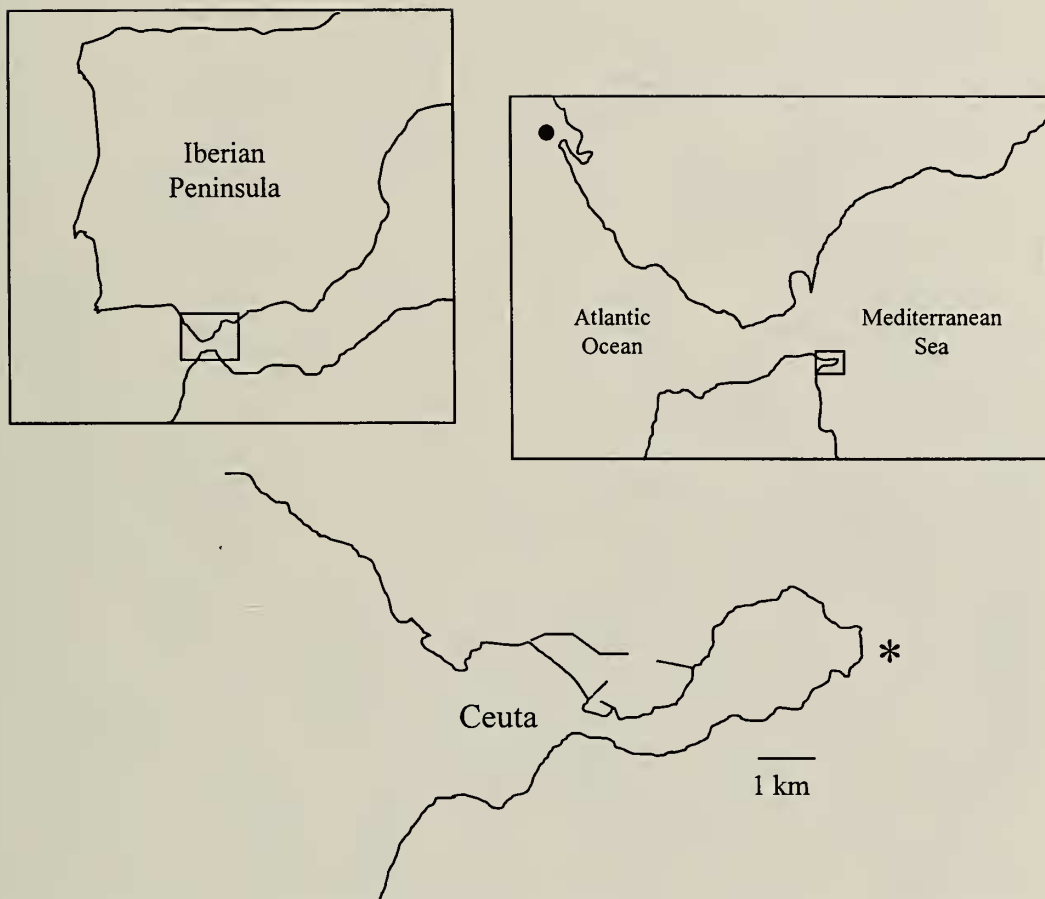


Fig. 1. Location of Ceuta in the Strait of Gibraltar. Gulf of Cádiz (the type locality) is represented by (●). An asterisk (*) indicates the place where *Pseudoprotella inermis* Chevreux, 1927 was collected from Ceuta.

on the hydroid *Sertularella gayi* Lamouroux from the same location.

Diagnosis.—Body smooth, without dorsal projections. Antenna 1 longer than body. Pereonite 3 with a pair of anterior lateral projections in female. Pereopods 5–7 increasing in robustness.

Description.—Male “a,” 10.2 mm in length. Head and pereonites without dorsal projections (Fig. 2a). Head plus pereonite 1 nearly as long as pereonite 2. Pereonites 2, 3 and 4 subequal in length. Pereonite 7 the shortest. Pereonite 2 with a pair of acute ventro-lateral projections near the coxa of gnathopods and a pronounced ventral proximal tubercle.

Antenna 1 longer than the body. Flagel-

lum of 24 articles, a little shorter than peduncle (Fig. 4a). Antenna 2 (Fig. 4b) as long as peduncular articles 1 and 2 of antenna 1; peduncular article 3 to flagellar segment 2 weakly setose. Peduncular articles 1 and 2 very short, article 3 nearly as long as 4.

Mouthparts: Mandibular molar process strong, bordered by robust teeth and with a reticulated inner surface (Fig. 3f, g). Left mandible with incisor divided into 5 teeth followed by lacinia mobilis divided into 5 teeth and 3 pectinate setae. Right mandible with incisor divided into 5 teeth followed by lacinia mobilis divided into numerous minute teeth and 2 pectinate setae. Distal segment of palp with a row of 1 long, 6

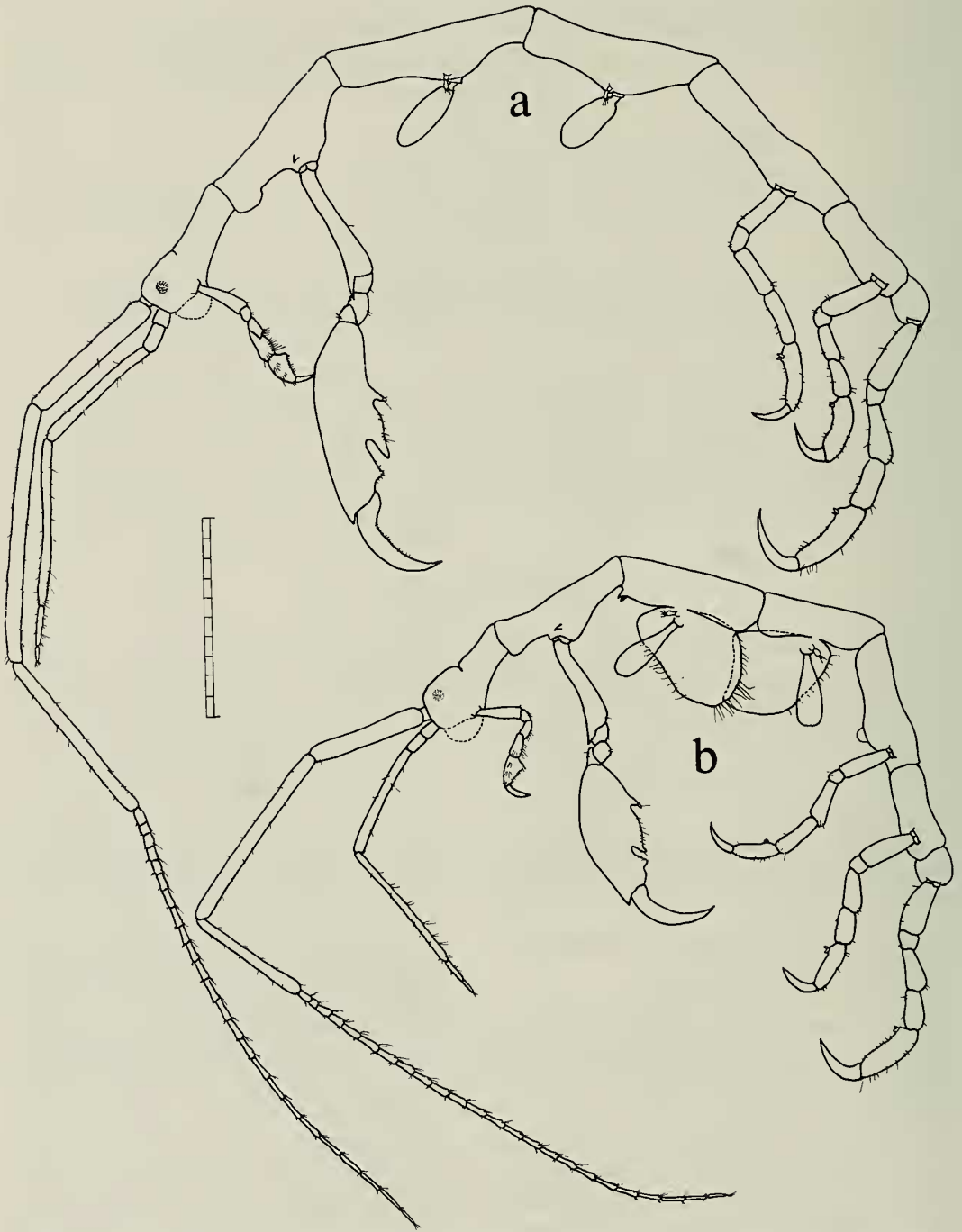


Fig. 2. *Pseudoprotella inermis* Chevreux, 1927 from Ceuta, North Africa. Lateral view: a, male; b, female. Scale bar: 2 mm.

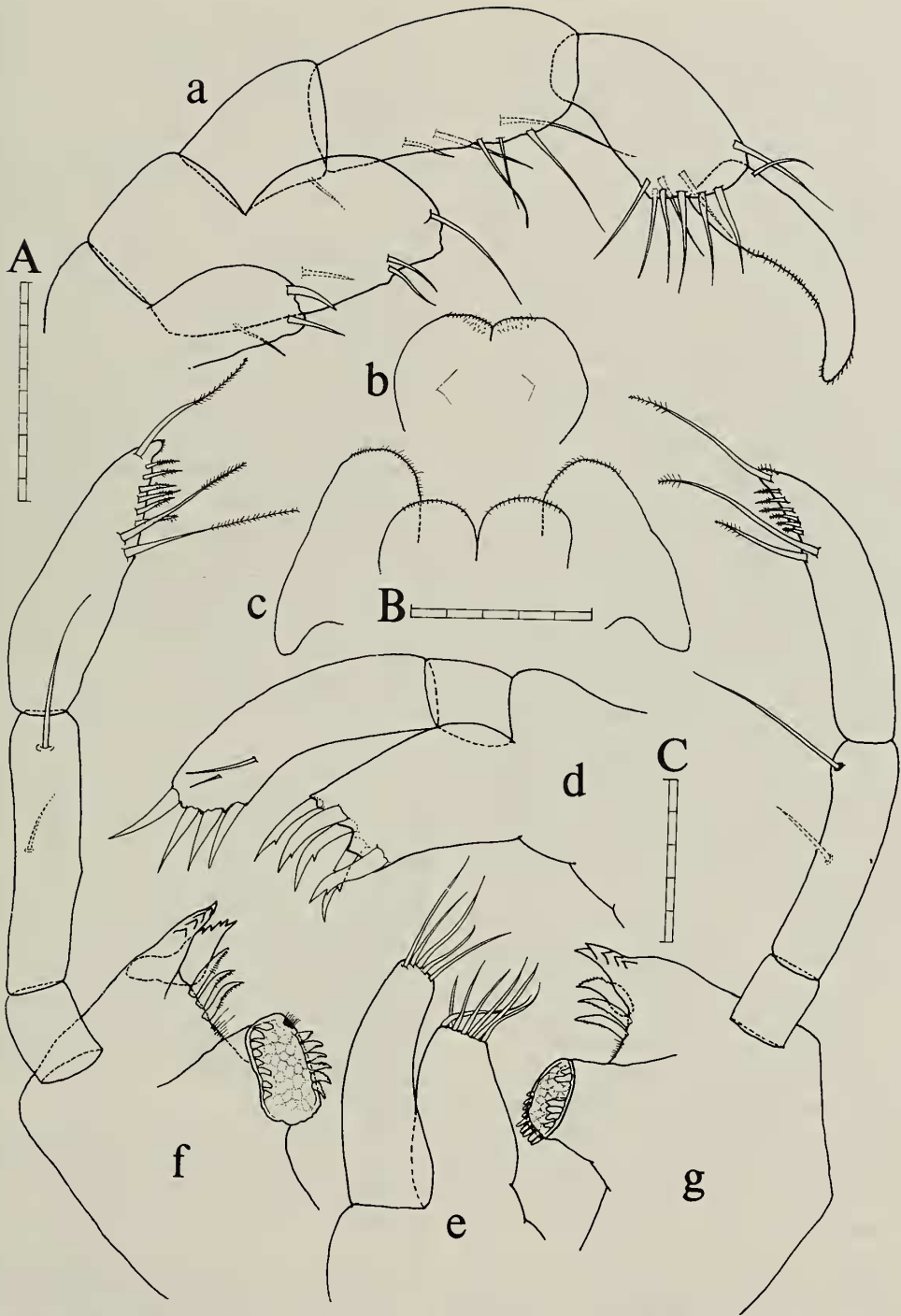


Fig. 3. *Pseudoprotella inermis* Chevreux, 1927 from Ceuta, North Africa. Male: a, maxilliped; b, upper lip; c, lower lip; d, maxilla 1; e, maxilla 2; f, left mandible; g, right mandible. Scale bars: A: 0.1 mm (a, f, g); B: 0.1 mm (b, c); C: 0.05 mm (d, e).

short and 2 long setae, from apex. Maxilla 1 (Fig. 3d) outer lobe with 5 serrate spines, article 2 of palp with 4 distal spines and a pair of dorsal setae. Maxilla 2 (Fig. 3e) inner lobe with 7 apical setae and shorter than outer lobe, with 5 apical setae. Inner plate of maxilliped (Fig. 3a) small and rounded with 2 simple setae; outer plate twice the size of inner one, with 1 prominent seta on end and 4 other setae. Palp 4-articulate; 1st article with 1 seta, inner margin of 2nd article with 6 setae; 3rd article with a row of 8 setae on lateral face and 1 seta on distal dorsal margin; article 4 falcate with rows of setules on grasping margin.

Gnathopod 1 (Fig. 4c) propodus wider but only a little longer than carpus; a pair of proximal grasping spines on palm.

Gnathopod 2 (Fig. 2a) inserted at middle of pereonite 2; basis slender, $\frac{4}{5}$ as long as pereonite 2, with a distal projection shaped like a carina on anterior margin. Ischium, merus and carpus approximately the same size (Fig. 4d). Propodus longer than basis, with acute projection on dorsal end. Length ca. 2.5 times width. Palm of propodus concave with a medial projection bearing a tooth, followed by a submedial projection and "U" notch. Dactylus curved, setose on inner margin.

Gills elliptical, length ca. 2 times width.

Pereopods 3–4 reduced, 2-articulate (Fig. 5a, b). Basal article short; length ca. 1.3 times width. Distal article, twice of basal one in length, with four distal setae.

Carpus of pereopod 5 (Fig. 5c) more slender than those of pereopods 6 and 7 (Fig. 5d, e). Palm of propodus concave with a robust proximal projection, provided with two grasping spines. Homologous articles on pereopods 5, 6 and 7 of increasing thickness from anterior to posterior.

Abdomen (Fig. 5f) with 2 pairs of rudimentary pleopods, unarticulated, bearing sparse setae. Medial penes.

Female "b," 7.2 mm in length. Ventral proximal tubercle on pereonite 2 less pronounced than in male (Fig. 2b). Pereonite 3 with two ventrolateral acute projections.

Oostegites on pereonite 3 with setose inner margin. Oostegites on pereonite 4 setose only on posterior margin. A pair of lobes in abdomen (Fig. 5g).

Localities.—Type locality: Gulf of Cadiz (36°53'N, 10°52'W), southern Spain, depth 99 m. Other localities: Ceuta (35°54'N, 5°16'W), North Africa, depth 30–40 m.

Remarks.—*Pseudoprotella inermis* was established by Chevreux (1927) based on a single specimen collected from a depth of 99 meters in the Gulf of Cadiz, situated about 120 km west from Ceuta, north African side of the Strait of Gibraltar. The description and figures for *P. inermis* lacked details of the antennae, pereopods, mouthparts and abdomen. *Pseudoprotella phasma* (Montagu 1804), its only congener, is widely distributed in the northwest Atlantic Ocean and the Mediterranean Sea (e.g., Mayer 1890, Chevreux & Fage 1925, Harrison 1940, 1944; McCain & Steinberg 1970, Hughes 1978, Krapp-Schickel 1993). The present study is the second record for *P. inermis*.

The description based on specimens from Ceuta coincides with the original description of Chevreux (1927) in the species diagnosis: absence of dorsal projections from the body and antennae 1 longer than the body. Specimens from Ceuta differ from the original descriptions by Chevreux in only two aspects. The gnathopod 1 of the specimens from Ceuta appears to be larger, and pereopods 3 and 4 are less reduced than those of the specimen described from the Gulf of Cadiz.

The first description of *Pseudoprotella phasma* was given by Montagu (1804) as *Cancer phasma*. Subsequently, several authors have dealt with the taxonomy and biology of *P. phasma* (e.g., Mayer 1890, Chevreux & Fage 1925, Harrison 1940, 1944; Hughes 1978, Krapp-Schickel 1993) from the northwestern Atlantic Ocean and the Mediterranean Sea. Several forms of this species have been described based on the position of dorsal projections and features of the propodus of the male gnatho-

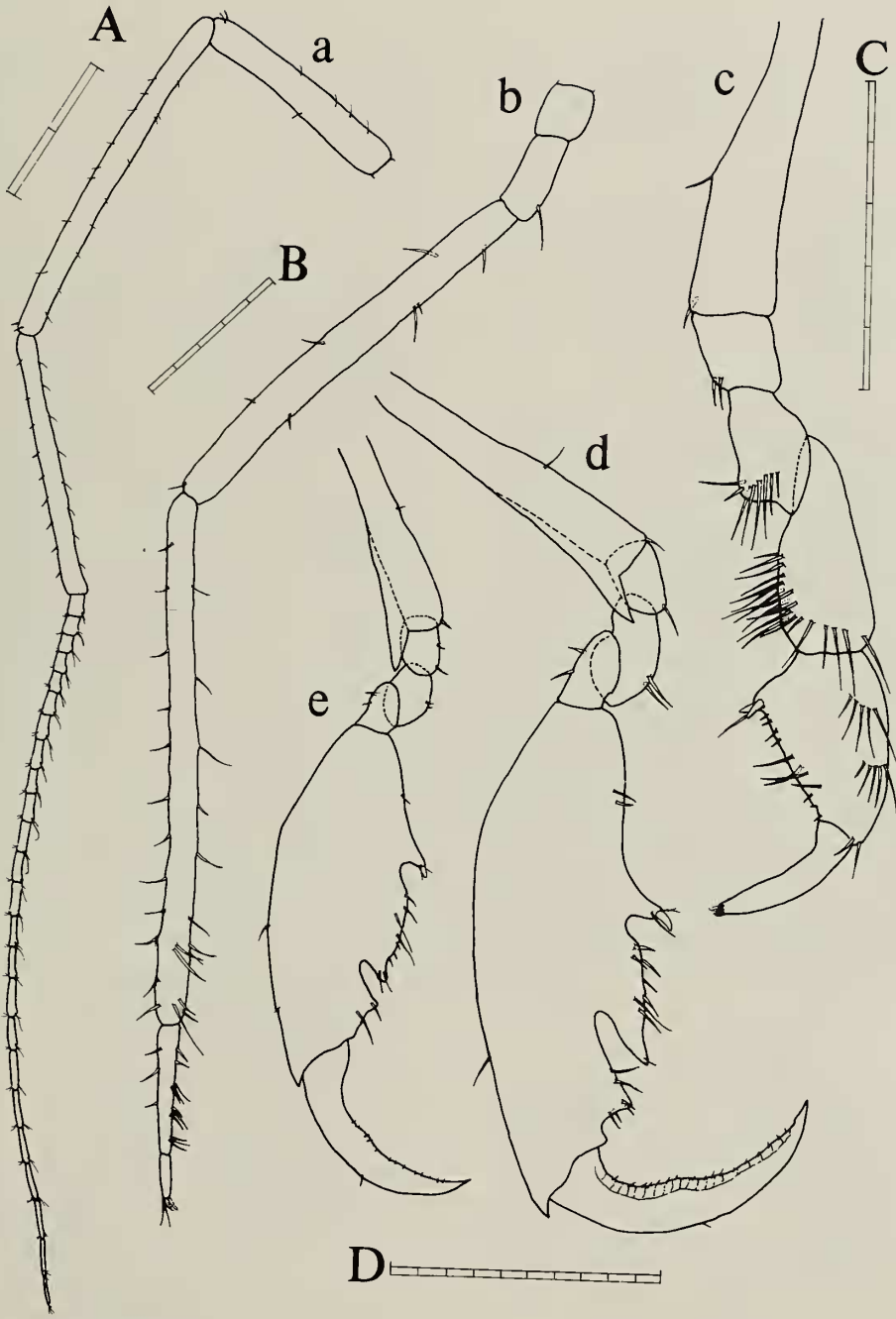


Fig. 4. *Pseudoprotella inermis* Chevreux, 1927 from Ceuta, North Africa. a-d, male: a, antenna 1; b, antenna 2; c, gnathopod 1; d, gnathopod 2; e, female gnathopod 2. Scale bars: A: 1 mm (a); B: 0.5 mm (b); C: 0.5 mm (c); D: 1 mm (d, e).

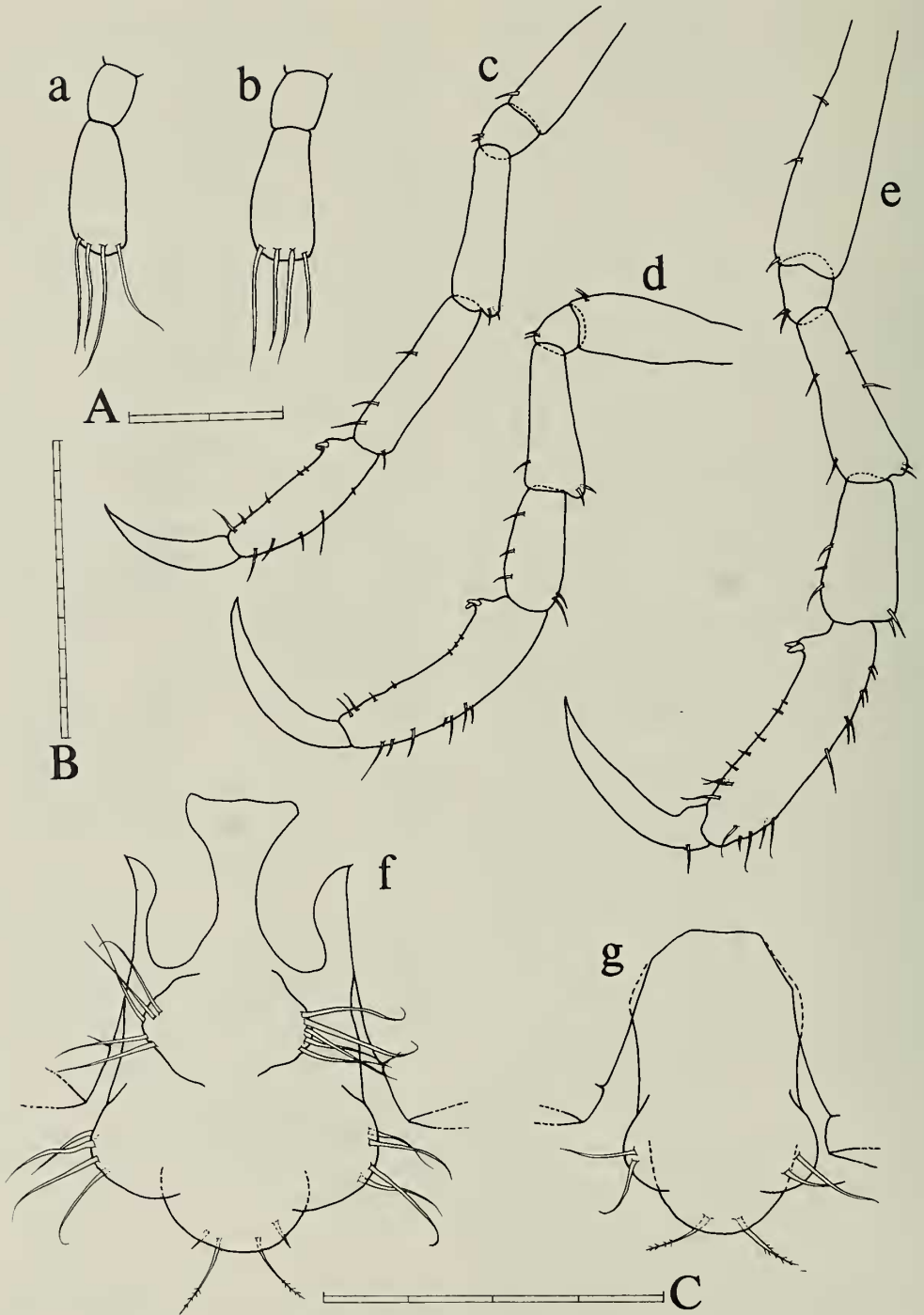


Fig. 5. *Pseudoprotella inermis* Chevreux, 1927 from Ceuta, North Africa. a-f, male: a, pereopod 3; b, pereopod 4; c, pereopod 5; d, pereopod 6; e, pereopod 7; f, abdomen (ventral view); g, female abdomen (ventral view). Scale bars: A: 0.1 mm (a, b); B: 1 mm (c, d, e); C: 0.2 mm (f, g).

pod 2 (Mayer 1890, Chevreux & Fage 1925, Krapp-Schickel 1993). These studies indicate that *P. phasma* has prominent dorsal projections on head to pereonite 2 in the forms *quadrispinis*, *typica* and *minor*, or on the head and pereonite 1 in the form *bispinis*. On the other hand, *P. inermis* has no distinct dorsal projections on the head and first two pereonites. Harrison (1940) reported that *P. phasma* juveniles of less than 5 mm in body length had already developed dorsal projections on the head and pereonite 1. This precludes the possibility that the present specimens of *Pseudoprotella* could be juvenile stages of *P. phasma*.

According to the descriptions of Chevreux & Fage (1925), Harrison (1944) and Krapp-Schickel (1993), *P. inermis* is also distinguished from *P. phasma* as follows: antenna 1 of *P. inermis* is longer than the body, while it is shorter than the body in *P. phasma*. Pereonite 3 of *P. inermis* carries a pair of anterior ventrolateral projections in females, lacking in males, while in *P. phasma* pereonites 3 and 4 each bear anterior lateral projections in males and females. The inner plate margin of maxilliped has 2 simple setae in *P. inermis*, while in *P. phasma* the number is variable, the inner plate with 2 setae (Chevreux & Fage 1925, Harrison 1944) or 3 (Krapp-Schickel 1993). In any case, the inner seta of the inner plate of maxilliped of *P. phasma* is always plumose while in *P. inermis* it is a simple seta. In *P. inermis* pereopods 5–7 increase in robustness respectively, carrying a few setae on the basis to propodus, while in *P. phasma* they are subequal and setose. Pleopods are sparsely setose in *P. inermis*, while densely setose in *P. phasma*.

The present specimens of *Pseudoprotella inermis* from Ceuta were collected from hydroids and algae in an area where visibility is 10–30 meters depending on weather conditions. The area, which is located near the top of the Ceuta's Peninsula, is exposed to the effects of local currents. *Pseudoprotella inermis* lives together with Atlantic caprellids such as *Caprella erethizon* Mayer, *C.*

tuberculata Bate & Westwood, and with *C. santosrosai*, recently described by Sánchez-Moyano et al. (1995b). The dominant posture observed for this species in clinging behavior over substrate was the "upright posture," as categorized by Takeuchi & Hirano (1995). The combination of weak swimming setae on antenna 2 and the long gnathopod 2 basis of the species suggests a predatory mode of life (Caine 1974, 1977).

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